FURUNO

Installation Manual
COLOR LCD SOUNDER FCV-295

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FURUNO ELECTRIC CO., LTD.

www.furuno.co.jp

⚠ SAFETY INSTRUCTIONS

The installer must read the applicable safety instructions before attempting to install the equipment.

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, can result in minor or moderate injury.

Warning, Caution	Prohibitive Action	Mandatory Action

⚠ WARNING

Turn off the power at the switchboard before beginning the installation. Connect to a dedicated breaker in the power distributor.

Fire or electrical shock can result if the power is left on.

Do not install the equipment where it may get wet from rain or water splash.

Water in the equipment can result in fire, electrical shock or damage the equipment.

Be sure no water leaks in at the transducer mounting location.

Water leakage can sink the vessel. Also, confirm that the transducer will not loosen by ship's vibration. The installer of the equipment is solely responsible for the proper installation of the equipment. FURUNO will assume no responsibility for any damage associated with improper installation.

Use the proper cable and fuse.

Use of an incorrect cable and fuse can damage the equipment and can cause fire.

⚠ WARNING

Be sure that the power supply is compatible with the voltage rating of the equipment.

Connection of an incorrect power supply can cause fire or damage the equipment. The voltage rating of the equipment appears on the label above the power connector.

Install the transducer according to the installation instructions.

Failure to install the transducer correctly may result in water leakage and damage to the ship's hull.

For wooden or FRP vessel using a steel tank, attach a zinc plate to the hull to prevent electrolytic corrosion.

Electrolytic corrosion can, in the worst case, result in loss of the transducer.

Do not disassemble or modify the equipment.

Fire, electrical shock or serious injury can result.

⚠ CAUTION

Ground the equipment to prevent mutual interference.

Observe the following compass safe distances to prevent interference to a magnetic compass:

	Standard compass	Steering compass
CV-295	0.80 m	0.50 m

Do not allow warm water or any other liquid other than seawater or freshwater to contact the transducer.

The transducer may become damaged.

Do not turn on the power when the transducer is in air.

The transducer may become damaged.

Do not install the transducer where noise or air bubbles is present.

Performance will be affected.

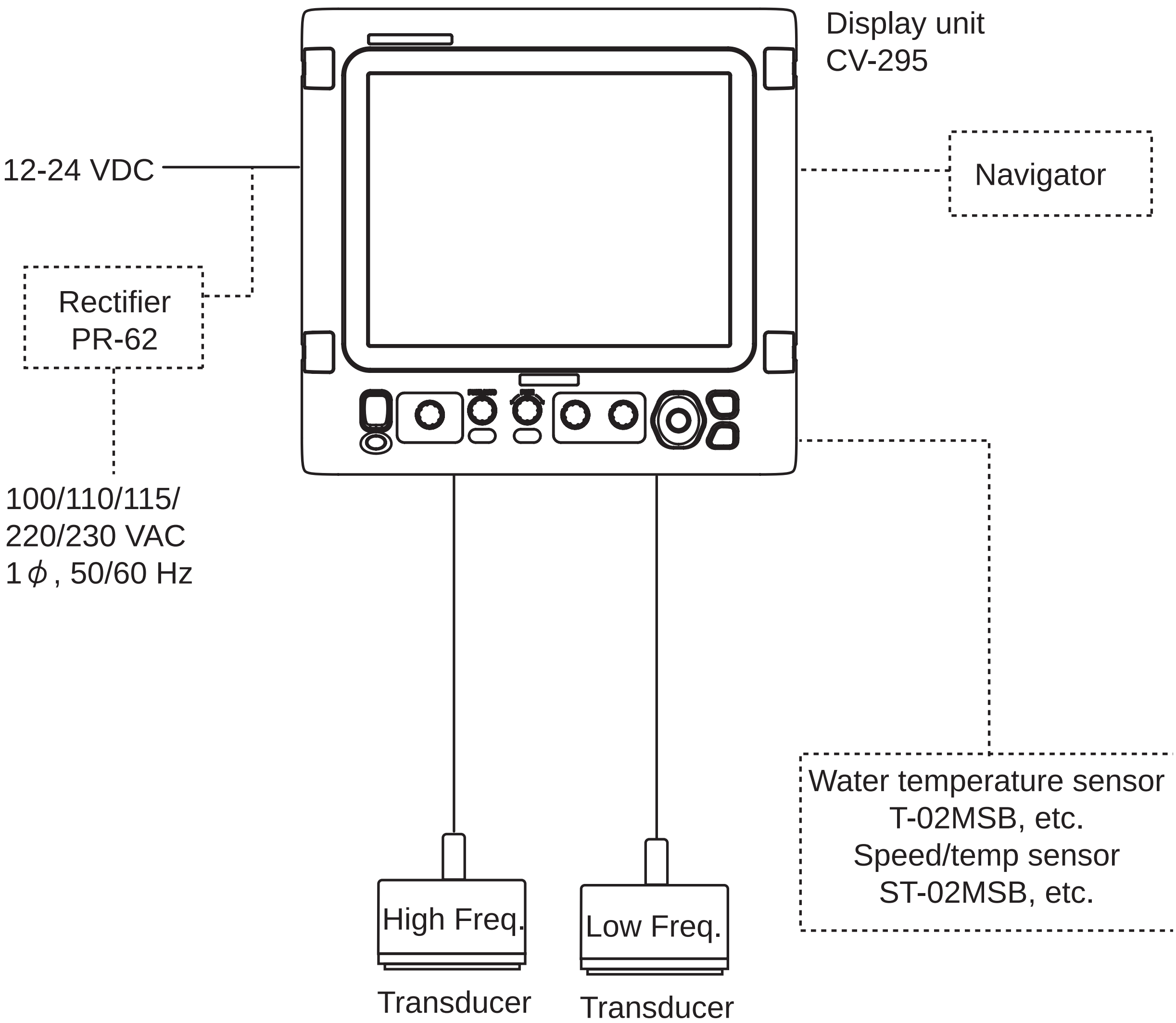
⚠ CAUTION

The transducer cable must be handled carefully, following the guidelines below.

- **Keep fuels and oils away from the cable.**
- **Locate the cable where it will not be damaged.**
- **The cable sheath is made of chloro-phrene or polychloride vinyl, which are easily by damaged plastic solvents such as toulene. Locate the cable well away from plastic solvents.**

SYSTEM CONFIGURATION

Basic configuration is shown with solid line.



EQUIPMENT LISTS

Standard supply

Name	Type	Code No.	Qty	Remarks
Display Unit	CV-295	-	1	
Spare Parts	SP02-05501	001-032-740	1 set	See packing list at back of this manual.
Accessories	FP02-05700	000-011-976	1 set	
Installation Materials	CP02-08401	001-032-750	1 set	

Option

Name	Type	Code No.	Remarks
Transducer	See next several pages.	-	
Thru-hull pipe		-	
Tank		-	
Cable	MJ-A6SPF0003-050C	000-154-054-10	one end 6 pin, 5 m, for navigator
	CO-SPEVV-SBC 2Px0.2SQ LF	000-111-680-10	5 m
		000-120-792-10	10 m
		000-120-793-10	15 m
Water temperature sensor	T-02MSB	000-040-040	Thru-hull type
	T-02MTB	000-040-026	Transom type
	T-03MSB	000-040-027	Thru-hull type
Speed/Temperature sensor	ST-02MSB	000-137-986-01	Thru-hull type
	ST-02PSB	000-137-987-01	Thru-hull type
Rectifier	PR-62	000-013-484	100 V AC
		000-013-485	110 V AC
		000-013-486	220 V AC
		000-013-487	230 V AC

Combination of transducer, thru-hull pipe and tank

Output (W)	Frequency (kHz)	Ship type	Transducer	Thru-hull pipe	Tank
1k/1k	28/50	Steel	28F-8 50B-9B	TWB-6000(2)	T-656
		FRP		-	-
	28/88	Steel	28F-8 88B-8	TWB-6000(2)	T-657
		FRP		-	-
	50/88	Steel	50B-9B 88B-8	TWB-6000(2)	T-658
		FRP		-	-
	50/200	Steel	50/200-1T 50/200-1ST	TFB-5000(1)	T-603
		FRP		-	T-603F
		Steel	50/200-12M	-	-
		FRP		-	-
1k/2k	28/200	Steel	28F-8 200B-8/8B	TWB-6000(2)	T-657
		FRP		-	-
	50/200	Steel	50B-9B 200B-8/8B	TWB-6000(2)	T-658
		FRP		-	-
	88/200	Steel	88B-8 200B-8/8B	TWB-6000(2)	T-659
		FRP		-	-
2k/2k	28/50	Steel	28F-18 50B-12	TFB-7000(2)	T-634
		FRP		TRB-1100(2)	T-634-F
	28/82	Steel	28F-18 82B-35R	TFB-7000(2)	T-636
		FRP		TRB-1100(2)	T-636-F
	28/88	Steel	28F-18 88B-10	TFB-7000(2)	T-636
		FRP		TRB-1100(2)	T-636-F
	28/200	Steel	28F-18 200B-8/8B	TFB-7000(2)	T-638
		FRP		TRB-1100(2)	T-638-F
		Steel	28BL-6HR 200B-8/8B	TFB-7000(2)	T-693
		FRP		TRB-1100(2)	T-693-F
	38/200	Steel	38BL-9HR 200B-8/8B	TFB-7000(2)	T-693
		FRP		TRB-1100(2)	T-693-F
	50/82	Steel	50B-12 82B-35R	TFB-7000(2)	T-643
		FRP		TRB-1100(2)	T-643-F
	50/88	Steel	50B-12 88B-10	TFB-7000(2)	T-643
		FRP		TRB-1100(2)	T-643-F
	50/200	Steel	50B-12 200B-8/8B	TFB-7000(2)	T-645
		FRP		TRB-1100(2)	T-645-F
		Steel	50BL-12HR 200B-8/8B	TFB-7000(2)	T-693
		FRP		TRB-1100(2)	T-693-F
	50/200	Steel	50BL-12 200B-8/8B	TFB-7000(2)	T-693
		FRP		TRB-1100(2)	T-693-F
	82/200	Steel	82B-35R 200B-8/8B	TFB-7000(2)	T-649
		FRP		TRB-1100(2)	T-649-F
	88/200	Steel	88B-10 200B-8/8B	TFB-7000(2)	T-649
		FRP		TRB-1100(2)	T-649-F

Output (W)	Frequency (kHz)	Ship type	Transducer	Thru-hull pipe	Tank
2k/2k	28/107	Steel	28F-18 100B-10R	TFB-7000(2)	T-636
		FRP		TRB-1100(2)	T-636-F
2k/3k	28/150	Steel	28F-18 150B-12H	TFB-7000(2)	T-637
		FRP		TRB-1100(2)	T-637-F
	50/107	Steel	50B-12 100B-10R	TFB-7000(2)	T-643
		FRP		TRB-1100(2)	T-643-F
	50/150	Steel	50B-12 150B-12H	TFB-7000(2)	T-644
		FRP		TRB-1100(2)	T-644-F
3k/2k	68/200	Steel	68F-30H 200B-8/8B	TFB-7000(2)	T-647
		FRP		TRB-1100(2)	T-647-F
	107/200	Steel	100B-10R 200B-8/8B	TFB-7000(2)	T-649
		FRP		TRB-1100(2)	T-649-F
3k/3k	28/38	Steel	28BL-12HR 38BL-15HR	TFB-7000(2)	T-681
		FRP		TRB-1100(2)	T-681-F
		Steel	28F-24H 38BL-15HR	TFB-7000(2)	T-681
		FRP		TRB-1100(2)	T-681-F
	28/50	Steel	28BL-12HR 50BL-24HR	TFB-7000(2)	T-681
		FRP		TRB-1100(2)	T-681-F
		Steel	28BL-12HR 50F-24H	TFB-7000(2)	T-681
		FRP		TRB-1100(2)	T-681-F
		Steel	28F-24H 50BL-24H	TFB-7000(2)	T-696
		FRP		TRB-1100(2)	T-696-F
		Steel	28F-24H 50BL-24HR	TFB-7000(2)	T-681
		FRP		TRB-1100(2)	T-681-F
		Steel	28F-24H 50F-24H	TFB-7000(2)	T-681
		FRP		TRB-1100(2)	T-681-F
	28/88	Steel	28BL-12HR 88F-126H	TFB-7000(2)	T-682
		FRP		TRB-1100(2)	T-682-F
		Steel	28F-24H 88F-126H	TFB-7000(2)	T-682
		FRP		TRB-1100(2)	T-682-F
	28/150	Steel	28BL-12HR 150B-12H	TFB-7000(2)	T-683
		FRP		TRB-1100(2)	T-683-F
		Steel	28F-24H 150B-12H	TFB-7000(2)	T-683
		FRP		TRB-1100(2)	T-683-F
	28/200	Steel	28BL-12HR 200B-12H	TFB-7000(2)	T-683
		FRP		TRB-1100(2)	T-683-F
		Steel	28F-24H 200B-12H	TFB-7000(2)	T-683
		FRP		TRB-1100(2)	T-683-F
	38/50	Steel	38BL-15HR 50BL-24HR	TFB-7000(2)	T-681
		FRP		TRB-1100(2)	T-681-F
		Steel	38BL-15HR 50F-24H	TFB-7000(2)	T-681
		FRP		TRB-1100(2)	T-681-F
	38/88	Steel	38BL-15HR 88F-126H	TFB-7000(2)	T-682
		FRP		TRB-1100(2)	T-682-F

Output (W)	Frequency (kHz)	Ship type	Transducer	Thru-hull pipe	Tank
3k/3k	38/150	Steel	38BL-15HR 150B-12H	TFB-7000(2)	T-683
		FRP		TRB-1100(2)	T-683-F
	38/200	Steel	38BL-15HR 200B-12H	TFB-7000(2)	T-683
		FRP		TRB-1100(2)	T-683-F
	50/88	Steel	50BL-24H 88F-126H	TFB-7000(2)	T-697
		FRP		TRB-1100(2)	T-697-F
		Steel	50BL-24HR 88F-126H	TFB-7000(2)	T-682
		FRP		TRB-1100(2)	T-682-F
		Steel	50F-24H 88F-126H	TFB-7000(2)	T-682
		FRP		TRB-1100(2)	T-682-F
	50/150	Steel	50BL-24HR 150B-12H	TFB-7000(2)	T-683
		FRP		TRB-1100(2)	T-683-F
		Steel	50F-24H 150B-12H	TFB-7000(2)	T-683
		FRP		TRB-1100(2)	T-683-F
	50/200	Steel	50BL-24H 200B-12H	TFB-7000(2)	T-695
		FRP		TRB-1100(2)	T-695-F
		Steel	50BL-24HR 200B-12H	TFB-7000(2)	T-683
		FRP		TRB-1100(2)	T-683-F
		Steel	50F-24H 200B-12H	TFB-7000(2)	T-683
		FRP		TRB-1100(2)	T-683-F
	68/150	Steel	68F-30H 150B-12H	TFB-7000(2)	T-646
		FRP		TRB-1100(2)	T-646-F
	68/200	Steel	68F-30H 200B-12H	TFB-7000(2)	T-646
		FRP		TRB-1100(2)	T-646-F
	88/150	Steel	88F-126H 150B-12H	TFB-7000(2)	T-685
		FRP		TRB-1100(2)	T-685-F
	88/200	Steel	88F-126H 200B-12H	TFB-7000(2)	T-685
		FRP		TRB-1100(2)	T-685-F
1k	28	Steel	28F-8	TFB-5000(1)	T-604
		FRP		TRB-1000(1)	T-604-F
	50	Steel	50B-6/6B	TFB-5000(1)	T-605
		FRP		TRB-1000(1)	T-605-F
		Steel	50B-9B	TFB-5000(1)	T-603
		FRP		TRB-1000(1)	T-603-F
	68	Steel	68F-8H	TFB-5000(1)	T-621
		FRP		TRB-1000(1)	T-621-F
	88	Steel	88B-8	TFB-5000(1)	T-606
		FRP		TRB-1000(1)	T-606-F
	200	Steel	200B-5S	TFB-5000(1)	T-605
		FRP		TRB-1000(1)	T-605-F
2k	28	Steel	28F-18	TFB-5000(1)	T-612
		FRP		TRB-1000(1)	T-612-F
		Steel	28BL-6HR	TFB-5000(1)	T-702
		FRP		TRB-1000(1)	T-702-F

Output (W)	Frequency (kHz)	Ship type	Transducer	Thru-hull pipe	Tank
2k	38	Steel	38BL-9HR	TFB-5000(1)	T-702
		FRP		TRB-1000(1)	T-702-F
	50	Steel	50B-12	TFB-5000(1)	T-611
		FRP		TRB-1000(1)	T-611-F
		Steel	50BL-12	TFB-5000(1)	T-702
		FRP		TRB-1000(1)	T-702-F
		Steel	50BL-12HR	TFB-5000(1)	T-702
		FRP		TRB-1000(1)	T-702-F
	82	Steel	82B-35R	TFB-5000(1)	T-609
		FRP		TRB-1000(1)	T-609-F
	88	Steel	88B-10	TFB-5000(1)	T-609
		FRP		TRB-1000(1)	T-609-F
	200	Steel	200B-8/8B	TFB-5000(1)	T-608
		FRP		TRB-1000(1)	T-608-F
3k	28	Steel	28F-24H	TFB-4000(1)	T-616
		FRP		TRB-1000(1)	T-616-F
		Steel	28BL-12HR	TFB-4000(1)	T-616
		FRP		TRB-1000(1)	T-616-F
	38	Steel	38BL-15HR	TFB-4000(1)	T-616
		FRP		TRB-1000(1)	T-616-F
	50	Steel	50F-24H	TFB-4000(1)	T-616
		FRP		TRB-1000(1)	T-616-F
		Steel	50BL-24HR	TFB-4000(1)	T-616
		FRP		TRB-1000(1)	T-616-F
		Steel	50BL-24H	TFB-4000(1)	T-694
		FRP		TRB-1000(1)	T-694-F
	68	Steel	68F-30H	TFB-5000(1)	T-614
		FRP		TRB-1000(1)	T-614-F
	88	Steel	88F-126H	TFB-4000(1)	T-618
		FRP		TRB-1000(1)	T-618-F
	107	Steel	100B-10R	TFB-5000(1)	T-609
		FRP		TRB-1000(1)	T-609-F
	150	Steel	150B-12H	TFB-5000(1)	T-615
		FRP		TRB-1000(1)	T-615-F
	200	Steel	200B-12H	TFB-5000(1)	T-615
		FRP		TRB-1000(1)	T-615-F

1. MOUNTING

NOTICE

Do not apply paint, anti-corrosive sealant or contact spray to coating or plastic parts of the equipment.

Those items contain organic solvents that can damage coating and plastic parts, especially plastic connectors.

1.1 Display Unit

⚠ WARNING

Turn off the power at the switchboard before beginning the installation. Connect to a dedicated breaker in the power distributor.

Fire or electrical shock can result if the power is left on.

Mounting considerations

- Locate the unit out of direct sunlight.
- Select a location where the display screen can be easily observed while operating the control panel.
- Leave sufficient space around the unit for maintenance and servicing. Recommended maintenance space appears in the outline drawings at the back of this manual.
- Observe the compass safe distances on page ii to prevent deviation of a magnetic compass.

The display unit can be mounted on the tabletop or on the panel (flush mounting). Mount the unit, referring to the outline drawings at the back of this manual.

The power cable is connected to the terminal board in the display unit. Therefore the power cable can not be disconnected easily like a connector. So connect the cable to a dedicated breaker in the power distributor in the ship.

1.2 Transducer

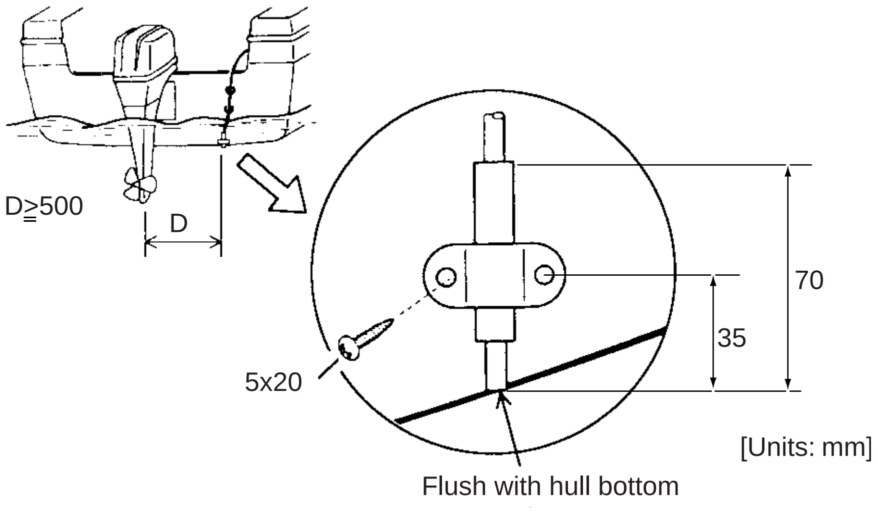
The performance of the echo sounder depends upon the transducer position. A place least affected by air bubbles should be selected since turbulence blocks the sounding path. Further, select a place least influenced by engine noise. It is known that air bubbles are fewest at the place where the bow first falls and the next wave rises, at usual cruising speed.

Note: The face of the transducer must be facing the sea bottom in normal cruising trim of the boat.

1.3 Water Temperature/Speed Sensor

Transom mount water temperature sensor T-02MTB

- Fix the cable at a convenient location on the transom with the cable clamp.
- When the cable is led through the transom board, make a hole of approx. 17 mm in diameter to pass the connector. After passing the cable, seal the hole with a sealing compound.

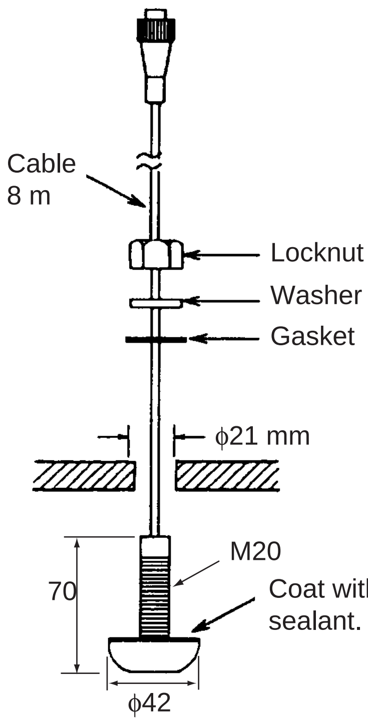


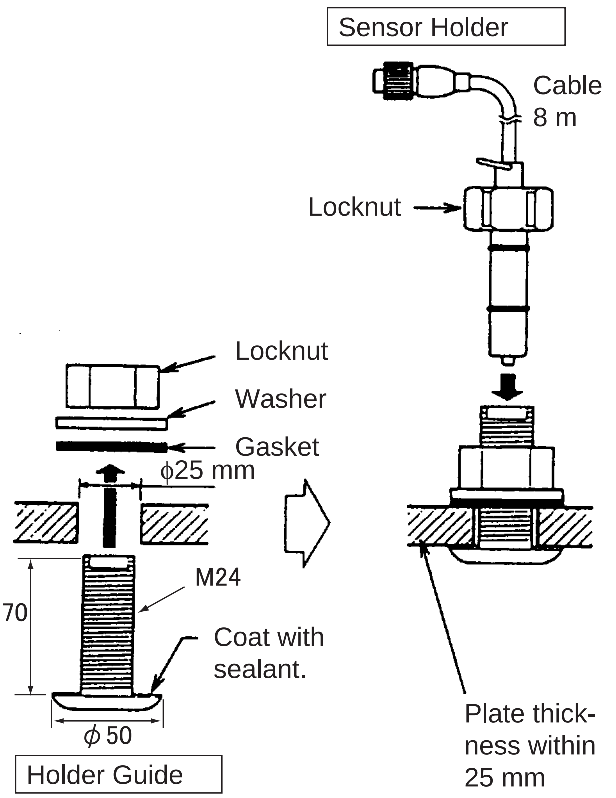
How to mount transom mount water temperature sensor T-02MTB

Thru-hull mount water temperature sensor T-02MSB, T-03MSB

Select a suitable mounting location considering the following points:

- Select a mid boat flat position. The sensor does not have to be installed perfectly perpendicular; however, the location should not be such that the transducer may be damaged when the boat is dry-docked.
- Locate away from equipment which gives off heat.
- Locate away from drain pipes.
- Select a location where vibration is minimal.

<table>
<tr><th>T-02MSB</th><th>T-03MSB</th></tr>
<tr><td>


Mounting procedure
1. Drill a hole of 21 mm in diameter in the mounting location.
2. Pass the sensor cable through the hole.
3. Pass gasket, washer and locknut onto cable in that order.
4. Coat the sensor flange with high quality sealant and then fasten the sensor with the locknut. (Torque: max. 59N·m)
5. Launch the boat to check for water leakage around the sensor.
</td><td>


Mounting procedure
1. Drill a hole of 25 mm in diameter in the mounting location.
2. Coat holder guide with high quality sealant, and pass gasket, washer and locknut onto holder guide in that order and then tighten the locknut.
3. Set the sensor holder to the holder guide from inside the boat and then tighten the locknut.
4. Launch the boat to check for water leakage around the sensor.
</td></tr>
</table>

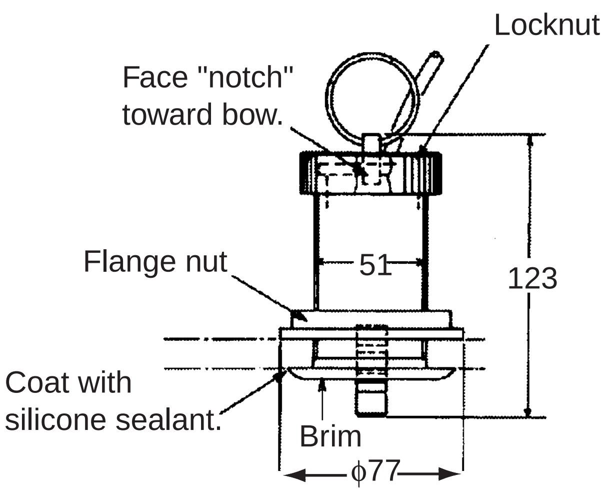
Assembling thru-hull water temperature sensor T-02MSB, T-03MSB

Through-hull mount water temperature/speed sensor ST-02MSB, ST02-PSB

Select a suitable mounting location considering the following:

- Select a mid-boat flat position. The sensor does not have to be installed perfectly perpendicular. The sensor must not be located where it might get damaged in dry-docking operation.
- Select a place apart from equipment generating heat.
- Select a place in the forward direction viewing from the drain hole, to allow for circulation of cooling water.
- Select a place free from vibration.

1. Dry-dock the boat.
2. Make a hole of approx. 51 mm diameter.
3. Unfasten locknut and remove the flange of the sensor.
4. Apply high-grade sealant to the flange of the sensor.
5. Pass the sensor casing through the hole.
6. Face the notch on the sensor toward boat's bow and tighten the flange.
7. Set the sensor section to the sensor casing and tighten the locknut.
8. Launch the boat and check for water leakage around the sensor.

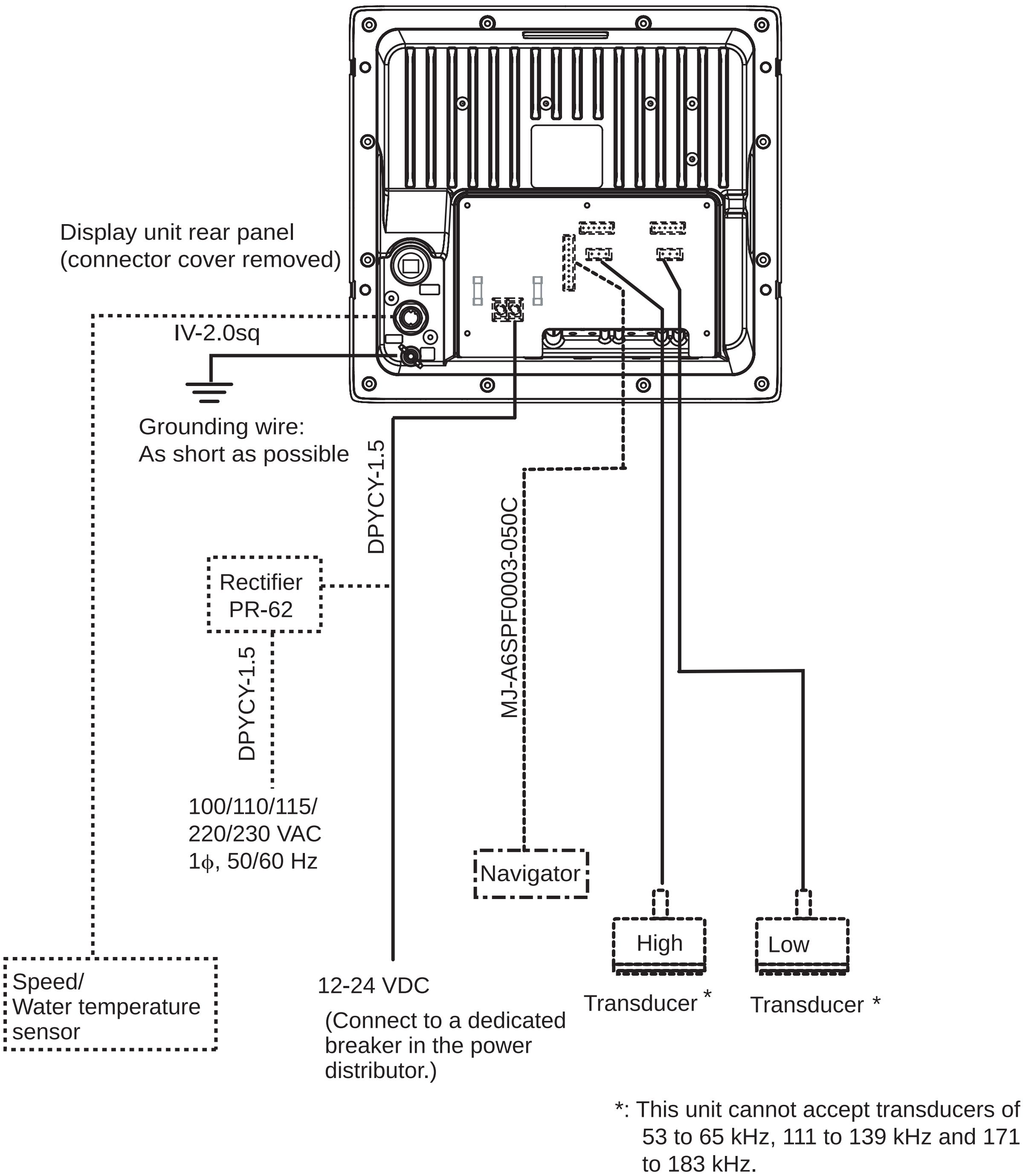


Water temperature/speed sensor ST-02MSB, ST-02PSB

2. WIRING

2.1 Interconnection

Refer to the interconnection diagram at the back of this manual for detailed information.

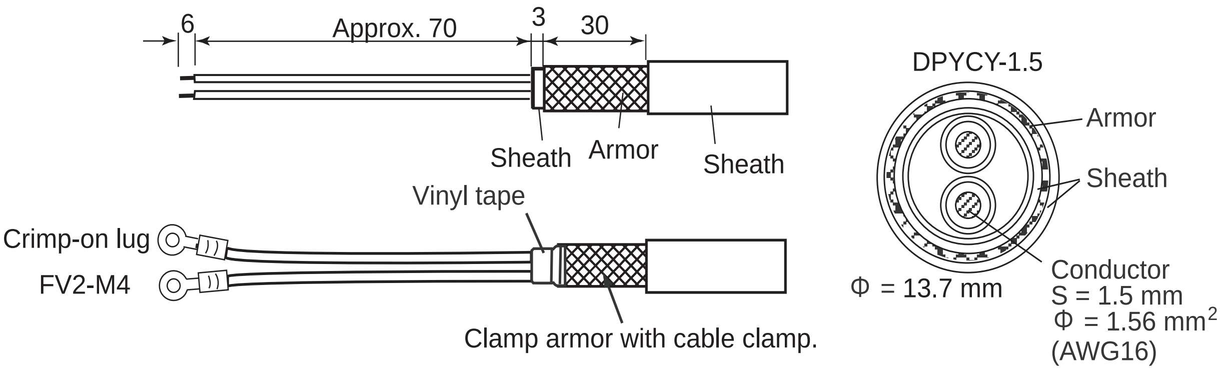


Wiring diagram for FCV-295

2.2 Cable Fabrication

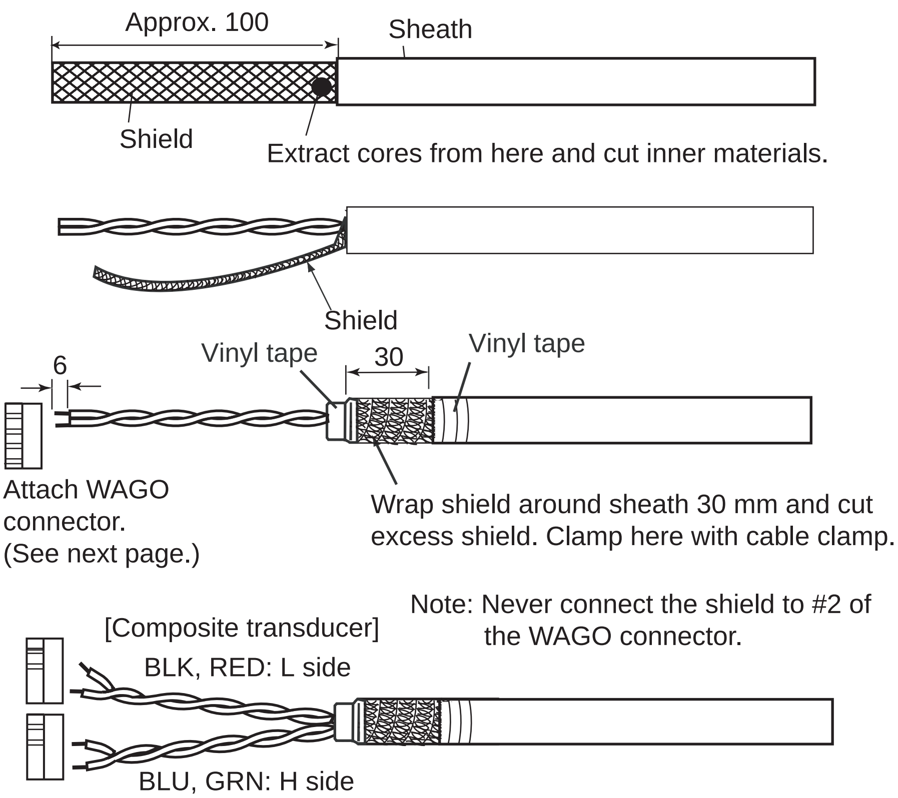
Power cable

This echo sounder is designed to be powered with 12-24 VDC. Use the cable DPYCY-1.5 (Japan Industry Standard) or equivalent.

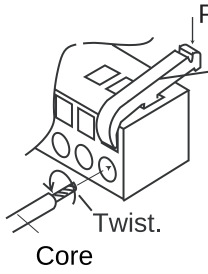


Transducer cable

Separate the transducer cable well away from power cables to prevent interference. Connect the cable to the transducer port (for high frequency and/or low frequency) at the rear of the display unit. Fabricate the cable as below.



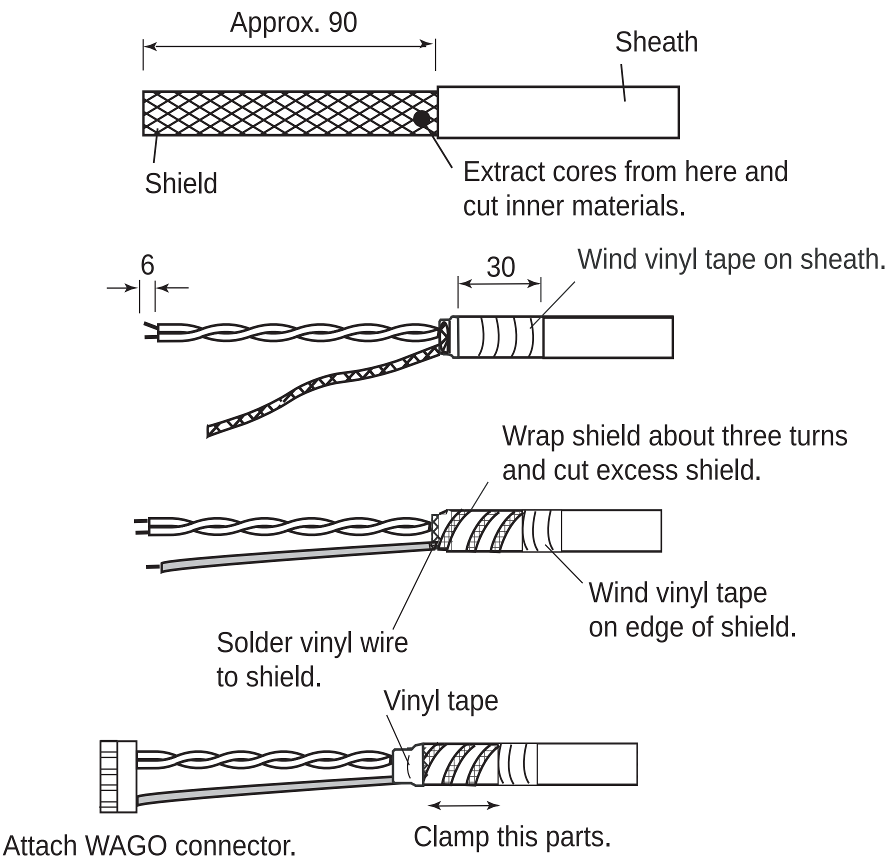
WAGO connector (for transducer and NMEA ports)



1. Twist conductors.
2. Insert opener and press it down.
3. Insert core to hole.
4. Release opener.
5. Pull the core to confirm that it is tightly fastened.

NMEA port

Connect a GPS navigator, etc. to NMEA port J2 #1 to #4. You can connect two sensors (for example, GPS receiver GP-310B and smart sensor). One connects to NMEA port J2 #1 to #2 and the other connects to the NMEA port J2 #3 to #4.



2.3 Input/Output Sentences

Input sentences

Sentence	Data	Remarks
BWC	Range/bearing to waypoint	
GGA	Time, position	GPS position
GLC	GRI, Time difference	Loran C
GLL	Latitude and longitude	GPS position
GNS	GNSS position fixing	
GTD	Time difference	Loran C
HDG	Ship's heading, deviation, variation	
HDT	True heading	
MDA	Weather information	
MTW	Water temperature	
MWV	Wind direction, wind speed (true or apparent)	
RMA	Latitude and longitude, TD, ground speed and course	Loran C
RMB	Recommended minimum navigation information	
RMC	Latitude and longitude, speed over ground and course over ground	GPS
VHW	True/magnetic bearing, speed through water	
VTG	Speed over ground and course over ground	
XTE	Cross track error	

Output sentences

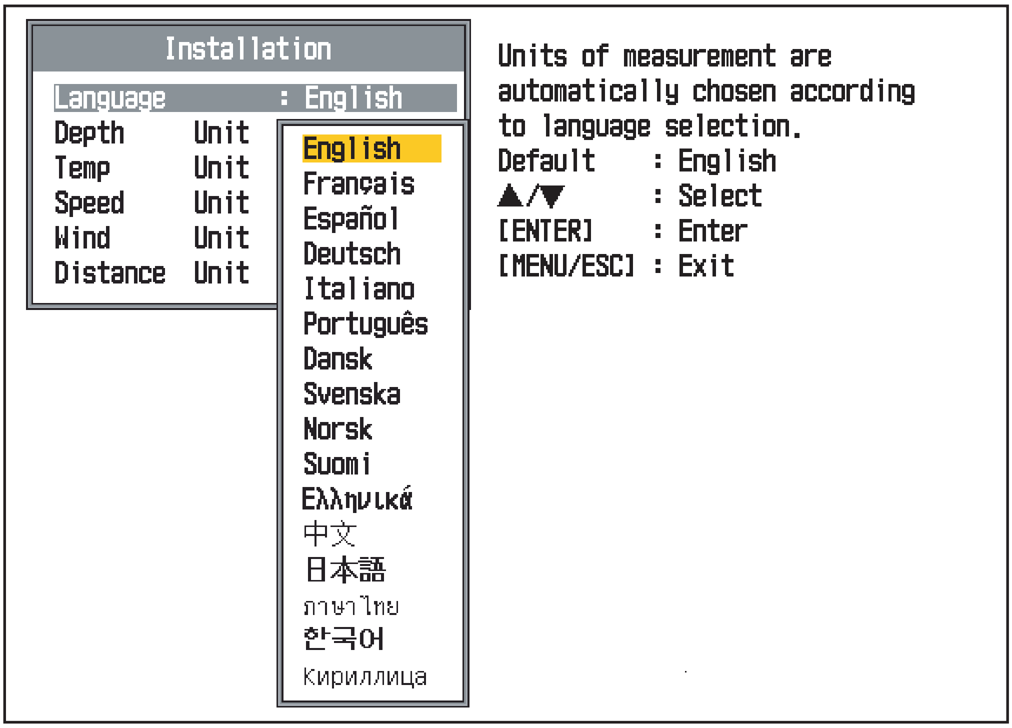
Sentence	Data	Remarks
DBT	Depth below transducer	Ver. 1.5
DPT	Depth below transducer and offset	Ver. 2.0
MTW	Water temperature	With connection of water temperature sensor
TLL	Marker line position	Ver. 2.0
SDmrk	Mark position (L&L) and its additional data	
VHW	Speed thru water	
RMB	Navigation information	Ver. 1.5
DBS	Depth below sea surface	

3. INITIAL SETTING

This chapter provides the information necessary for initial setup of the equipment. First turn on the power and set display language. Then, set transducer used, by model number (FURUNO transducer only) or by specifications.

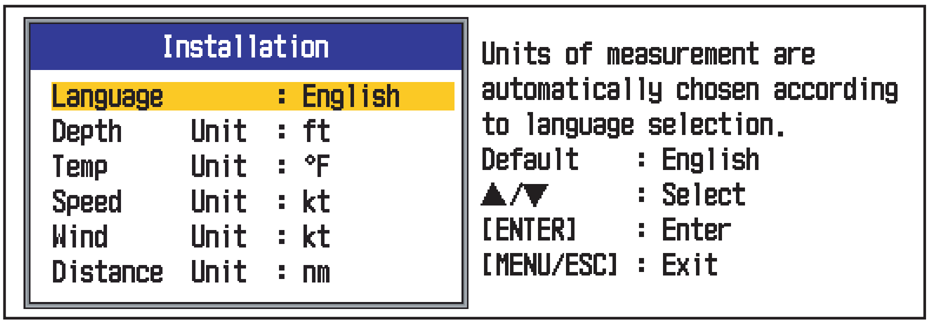
3.1 Language Setting

1. Press [⏻ **/BRILL**] key to turn on the power. The following display appears.



Language setting screen

2. Press ▼ or ▲ to select a desired language, and then press the **ENTER** key to set. The units setting screen appears.



Unit setting screen

3. Set the units of measurement if necessary. For example, to set the distance unit, press ▼ to select "Distance Unit" and press the **ENTER** key. The list of selectable distance units is displayed.

4. Press ▼ or ▲ to select necessary unit and then press the **ENTER** key to set.
   - Depth: m, ft, fa, pb, HR (Japanese unit)
   - Temp: °C, °F
   - Speed: kt, km/h, mph
   - Wind: kt, km/h, mph, m/h
   - Distance: nm, km, sm
5. Press the **MENU** key. The following message appears.

```
The transducer setting is not appropriate.
Please set the transducer appropriately.
```

6. Press any key. The transducer setting screen appears. Proceed to next section.

3.2 Transducer Data

⚠ CAUTION

Set the transducer model number properly.

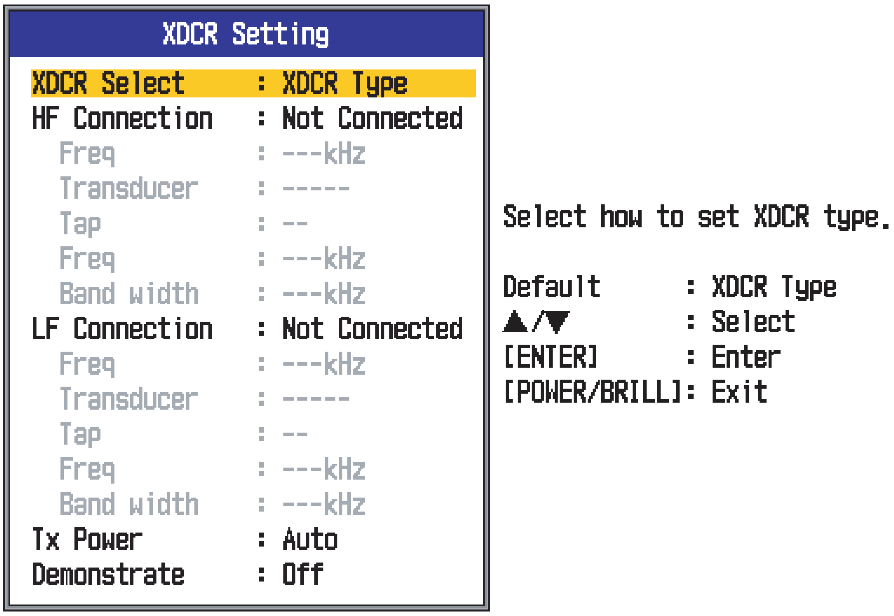
Wrong transducer setting can damage the transducer and void the warranty.

Entering transducer data by transducer model

The following table shows the transducers programmed in the FCV-295.

Type	Output (kW)	Tap	Type	Output (kW)	Tap
28F-8	1	B	50BL-24HR	3	D
28BL-6HR	2	A	50F-24H	3	B
28F-18	2	B	68F-8H	1	A
28BL-12HR	3	A	68F-30H	3	B
28F-24H	3	D	82B-35R	2	E
38BL-9HR	2	B	88B-8	1	D
38BL-15HR	3	D	88B-10	2	C
50B-6B	1	A	88F-126H	3	E
50/200-IT (50 kHz)	1	B	100B-10R	3	E
50/200-1ST (50 kHz)	1	B	150B-12H	3	C
50B-9B	1	A	200B-5S	1	D
50B-12	2	A	50/200-1T (200 kHz)	1	C
50BL-12	2	A	50/200-1ST (200 kHz)	1	A
50BL-12HR	2	B	200B-8B	2	C
50BL-24H	3	D	200B-12H	3	C

1. At the transducer setting screen, confirm that "XDCR Select" is set to "XDCR Type" (default setting).

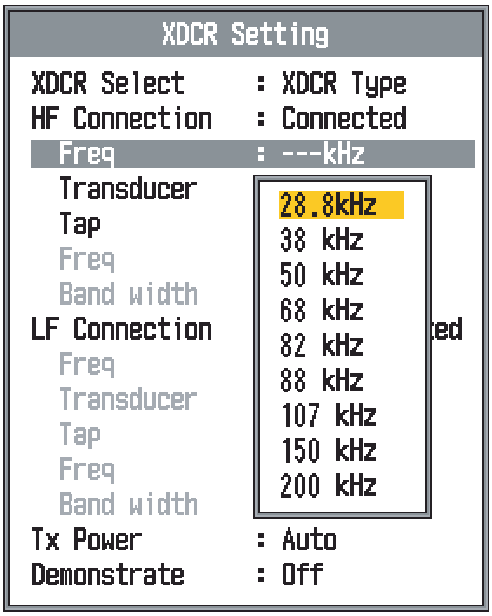


Transducer setting screen

2. If a high frequency transducer is fitted, press ▼ to select "HF Connection" and then press the **ENTER** key.



3. Press ▲ to select "Connected" and then press the **ENTER** key.
4. Press ▼ to select "Freq" and then press the **ENTER** key.



5. Press ▼ or ▲ to select the transducer frequency and then press the **ENTER** key.

6. Press ▼ to select "Transducer" and then press the **ENTER** key. The list of programmed transducers appears.

200B-5S
50/200-1T
50/200-1ST
200B-8B
200B-12H

(Example: 200 kHz)

7. Press ▼ to ▲ select transducer connected and then press the **ENTER** key.
8. Jot down the alphabet which appears on the "Tap" line. You may need to change the tap setting at the rear of the display unit depending on the transducer type which is connected. For details, see below.
9. If a low frequency transducer is fitted, repeat steps 2 to 8.

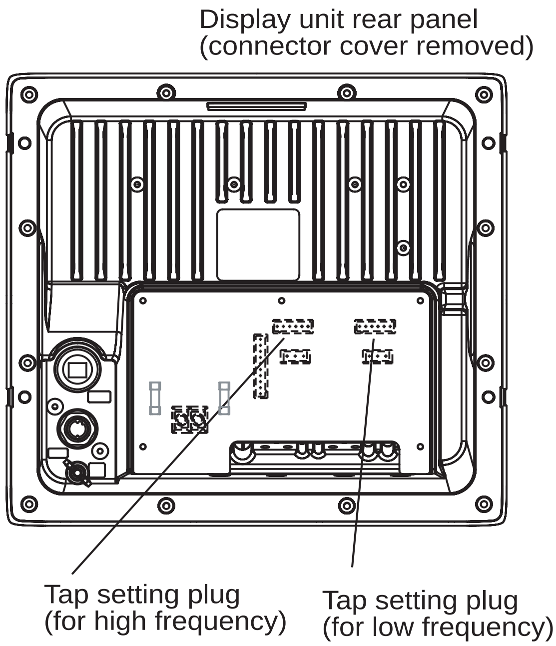
   Note: Leave the "Tx Power" setting at "Auto".

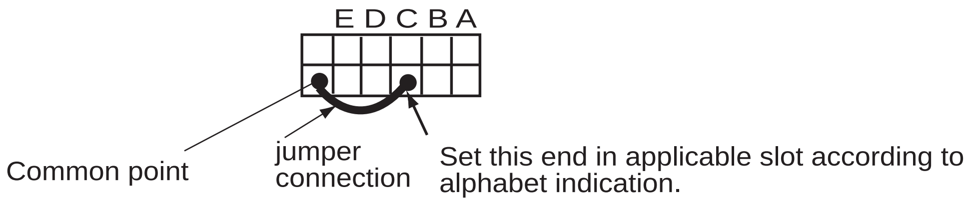
10. Press and hold down the [⏻ /**BRILL**] key to turn off the power.

   Note: To confirm the transducer selection after completion of the setting, turn on the power while pressing any key. Release the key after the "XDCR Setting" dialog box appears.

Tap setting

Set the tap according to the alphabet shown when you selected transducer type.





Entering transducer data by transducer specifications

To connect the transducers which are not programmed, do as follows:

Note: The transducers of 53 - 65 kHz, 111 to 139 kHz and 171 - 183 kHz cannot be connected to the FCV-295 because of noise.

1. At the XDCR Setting dialog box, select "XDCR Select" and press the **ENTER** key.

   The following screen appears.

   XDCR Type
   Manual

2. Press ▼ to select "Manual", and then press the **ENTER** key.
3. If a high frequency transducer is fitted, press ▼ to select "HF Connection" and then press the **ENTER** key.

   Connected
   Not connected

4. Press ▲ to select "Connected" and then press the **ENTER** key.
5. Press ▼ to select "Freq" and then press the **ENTER** key.

   ▲
   --- kHz
   ▼
   (25.0～220kHz)

6. Press ▼ or ▲ to set the frequency of the transducer which is connected and then press the **ENTER** key.
7. Press ▼ to select "Band width" and then press the **ENTER** key.
8. Press ▼ or ▲ to set the value for the bandwidth and then press the **ENTER** key. If the band-width is not entered manually, it is automatically set to 1/10 of the transducer frequency.
9. If a low frequency transducer is fitted, repeat steps 3 to 8.

   Note: Leave the "Tx Power" at "Auto".

10. Press and hold down the [⏻/**BRILL**] key to turn off the power.

3.3 Speed/Water Temperature Sensor Calibration

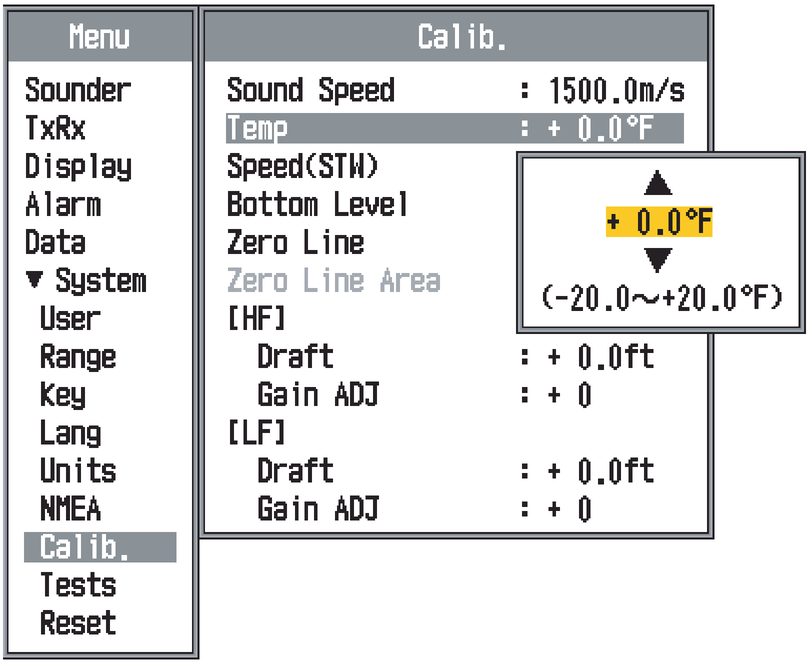
If the optional speed and/or water temperature sensor is connected, set it up as follows:

1. Turn on the power and press the **MENU** key.

   The main menu and sub-menu appear.

2. Press ▼ to select "System" and "Calib" and then press the **ENTER** key.

3. Press ▼ to select "Temp" and then press the **ENTER** key.

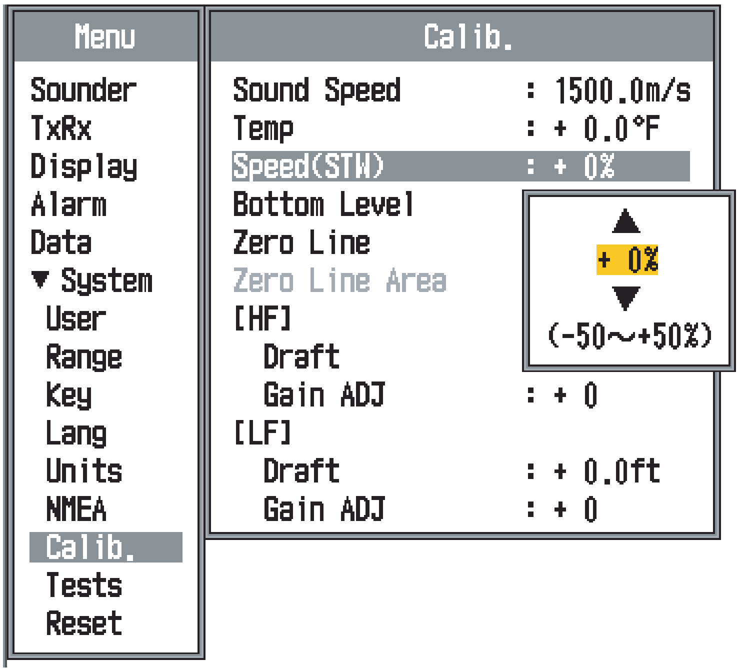


Temperature calibration screen

4. Press ▼ or ▲ to set the value for the temperature calibration and then press the **ENTER** key.

   For example, if the temperature indication is 2.5°C higher than the actual value, set “-2.5°C”.

5. To calibrate the speed value, press ▼ to select "Speed(STW)" and then press the **ENTER** key.



6. Press ▼ or ▲ to set the value for the speed calibration and then press the **ENTER** key.

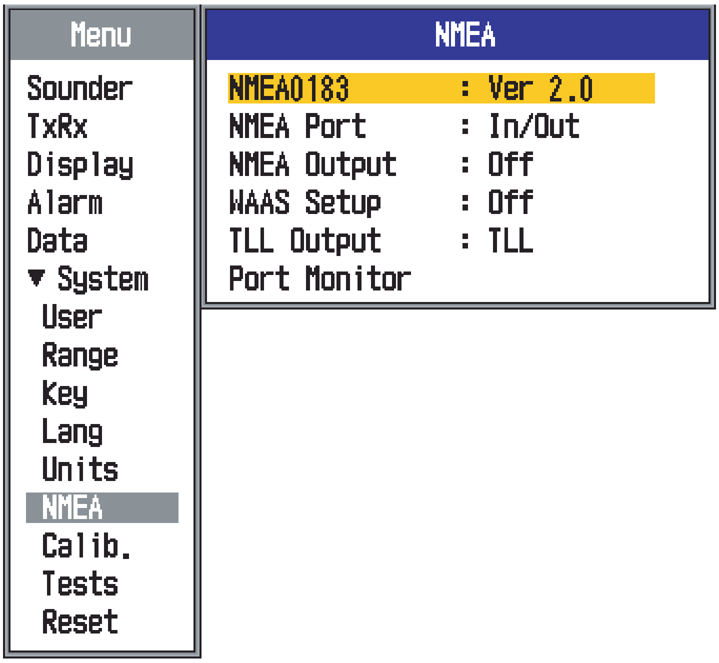
   For example, if the speed indication is 5% lower than the actual value, set +5%.

7. To close the menu, press the **MENU/ESC** key twice.

3.4 NMEA Port Setting

If a GPS navigator and/or other sensor are connected, set up as follows.

1. Press the **MENU** key.
2. Press ▼ to select "System" and "NMEA" and then press the **ENTER** key.



NMEA setting menu

3.Press ▼ to select the item to set and then press the **ENTER** key.

4.Press ▼ or ▲ to select an appropriate one and then press the **ENTER** key.

Description for each item of the NMEA menu

NMEA0183: Choose NMEA0183 version of navigation equipment connected to the NMEA port, among Ver. 1.5, Ver. 2.0 or Ver. 3.0. "SPECIAL" is for use with a navigator whose baud rate is 600 bps.

NMEA Port: The NMEA terminals in the NMEA port can function as input ports or input/output port. Change the setting to "In/In" when connecting GP-310B/320B/330B and a wind sensor. When connecting the GP-320B/330B and a wind sensor, first turn on "WAAS Setup" and then select "In/In" as the NMEA Port setting.

- In/Out: NMEA port J2 #1 & #2 is output port and J2 #3 & #4 is input port.
- In/In: NMEA port J2 #1 & #2 changes to input port. (Available with connection of the GP-310B/320B/330B and a wind sensor.)

NMEA Output: Set the output data sentences.

- Off: Outputs the "output data sentences" created in the FCV-295 (see page 8).
- On: Outputs the "output data sentences" of FCV-295 and sentences which are input from other equipment.

WAAS Setup: Choose how to use the WAAS signal when connecting with a WAAS capable GPS receiver, for example GP-320B/330B. The message types (WAAS-00 to WAAS-27) are used as WAAS correction. Choose WAAS-00 to enable WAAS.

TLL Output: Output the position selected by the **MARK** key to the plotter connected.

- Off: Does not output latitude/longitude.
- TLL: Outputs latitude/longitude.
- FURUNO-TLL: Outputs latitude/longitude, depth and water temperature. This requires FURUNO-TLL enabled device.

Port Monitor: Port Monitor provides information for the data sentences input from the NMEA port. Press the **ENTER** key to display the latest data sentence information. To display this information on the Port 2 screen when two sensors are connected, set NMEA Port on the NMEA menu to In/In. To terminate the port monitor, select "Exit" and press the **ENTER** key. And then, select Yes and press the **ENTER** key.

APPENDIX
TRANSDUCER 82B-35R

The 82B-35R is a transducer with wide bandwidth of 65 kHz-110 kHz. It is constructed to provide protection against slamming.

Transducer, thru-hull pipe and tank list

Frquency (kHz)	Transducer	Hull Material	Tank (Code No.)	Fasten inside hull (Code No.)	Fasten outside hull (Code No.)
15/88	15F-4S/82B-35R	Steel	T-628 (000-015-921)	TWB-6000 (2) (000-015-207)	-
		FRP	T-628-F (000-015-922)	TRB-1100 (2) (000-015-218)	-
	15F-10/82B-35R	Steel	T-629 (000-015-804)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-629-F (270-601-660)	TRB-1100 (2) (000-015-218)	-
28/88	28F-18/82B-35R	Steel	T-636 (000-015-813)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-636F (000-015-814)	TRB-1100 (2) (000-015-218)	-
50/88	50F-8G/82B-35R	Steel	T-636 (000-015-813)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-636F (000-015-814)	TRB-1100 (2) (000-015-218)	-
	50B-12/82B-35R	Steel	T-643 (000-015-821)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-643F (000-015-822)	TRB-1100 (2) (000-015-218)	-
88/200	82B-35R/200B-8/ 200B-8B/200B-8N	Steel	T-649 (000-015-833)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-649F (000-015-834)	TRB-1100 (2) (000-015-218)	-

Connection

Connect the 82B-35R transducer to either the "HF" or "LF" connector, referring to page S-1.

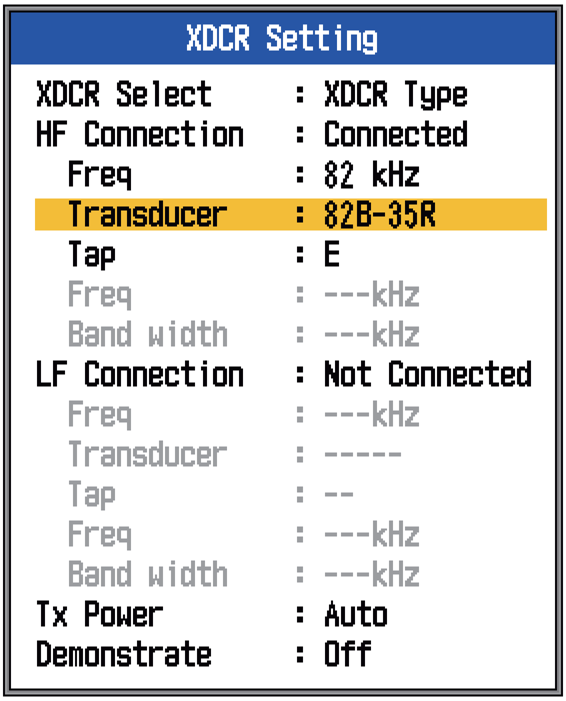
Tap Setting

Referring to page 12, set the tap to E.

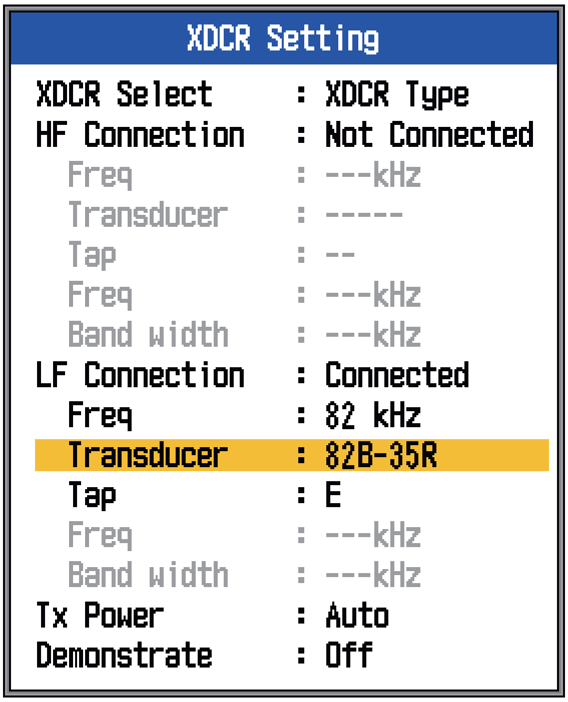
Setting for dual frequency transmitting

1. Set the XDCR SELECT menu as follows (see page 11 and 12).

Setting for “HF” connection

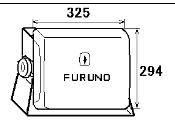
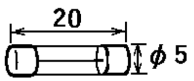
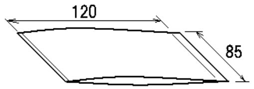
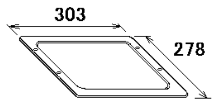
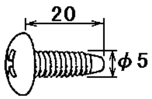
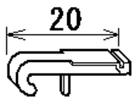
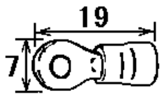


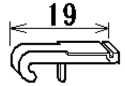
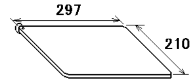
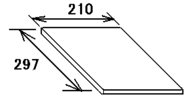
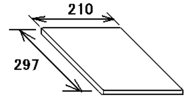
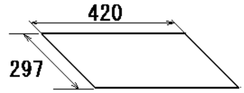
Setting for “LH” connection



2. Press the [PWR] key to turn the power off, and turn it on again.
3. Press the MENU key to show the menu.
4. Select the [Sounder] and press the ENTER key.
5. See the section "1.19.1 Sounder menu" in the Operator's Manual for how to set "Freq Choice" and "Freq Control" for high and low frequencies.

PACKING LIST FCV-295-J/E

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
指示器 DISPLAY UNIT		CV-295 000-011-835-00 **	1
予備品 SPARE PARTS		SP02-05501	
ﾋｭｰｽﾞ FUSE GLASS TUBE TYPE		FGMB 125V 6A PBF 000-157-492-10	4
付属品 ACCESSORIES		FP02-05700	
ﾌｨﾙﾀｰｸﾘｰﾅｰ LCD CLEANING CLOTH		02-155-1082-1 100-332-651-10	1
工事材料 INSTALLATION MATERIALS		CP02-08401	
Fﾏｳﾝﾄﾖｳｽﾎﾟﾝｼﾞ FLUSH MOUNTING SPONGE		02-160-1201-0 100-344-030-10	1
+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ 1ｼｭ SELF-TAPPING SCREW		5X20 SUS304 000-162-608-10	4
操作ﾚﾊﾞｰ TERMINAL OPENER		231-131 000-165-800-10	1
圧着端子 CRIMP-ON LUG		FV2-M4 000-157-229-10	2

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
操作ﾚﾊﾞｰ TERMINAL OPENER		734-230 000-147-417-10	1
図書 DOCUMENT			
操作要領書（ﾀｹﾞﾝ） OPERATOR'S MANUAL (MLG)		MLG-23760-* 000-168-515-1*	1
装備要領書 INSTALLATION MANUAL		IM*-23760-* 000-168-513-1* **	1
取扱説明書 OPERATOR'S MANUAL		OM*-23760-* 000-167-100-1* **	1
ﾌﾗｯｼｭﾏｳﾝﾄ型紙 FLUSH MOUNTING TEMPLATE		C22-00703-* ﾜ/ｴｲ 000-168-518-1*	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

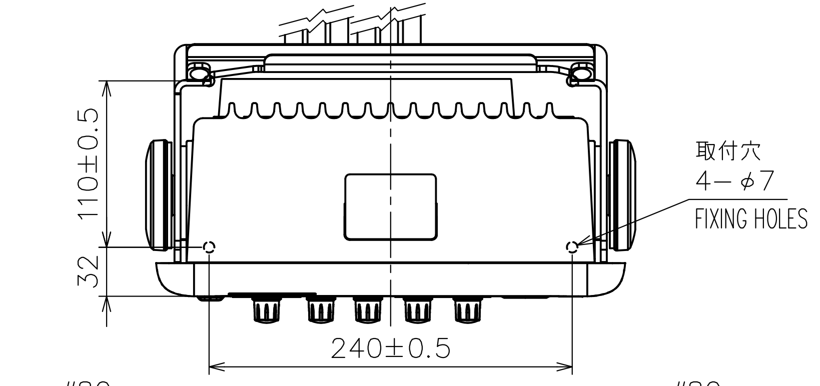
（略図の寸法は、参考値です。DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

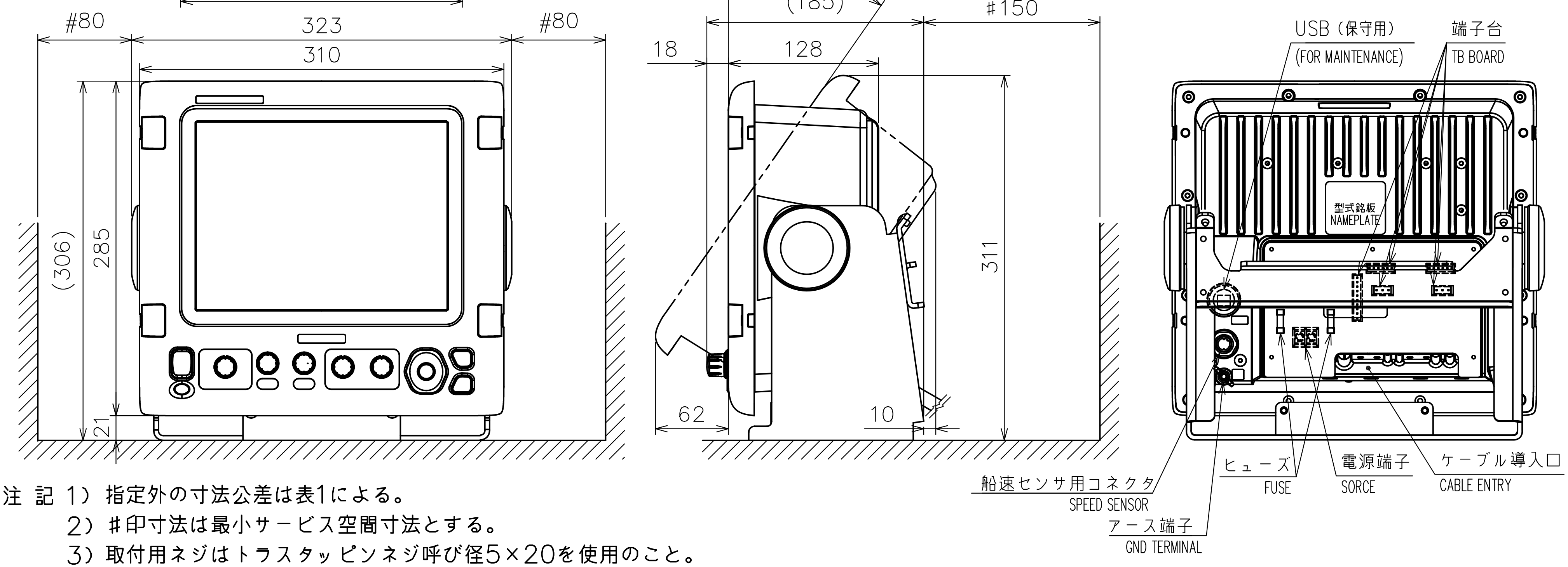
型式/ｺｰﾄﾞ番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

FURUNO

表１　TABLE 1

寸法区分（mm）DIMENSION	公差（mm）TOLERANCE
L≦50	±1.5
50＜L≦100	±2.5
100＜L≦500	±3





注記
1）指定外の寸法公差は表1による。
2）＃印寸法は最小サービス空間寸法とする。
3）取付用ネジはトラスタッピンネジ呼び径5×20を使用のこと。
4）装備ケーブルはサービス時、本体を前方に十分引き出せるよう余裕を持たせること。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS ø5x20 FOR FIXING THE UNIT.
4. KEEP SUFFICIENT CABLE LENGTH BEHIND THE UNIT FOR MAINTENANCE.

DRAWN	Nov. 1 '07 T.YAMASAKI	TITLE	CV-295
CHECKED	Nov. 1 '07 T.TAKENO	名称	指示部（卓上装備）
APPROVED	Nov.12'07 R.Esumi		外寸図
SCALE 1/5	MASS 7.0 ±10% kg　質量はケーブルを含まず。MASS W/O CABLE.	NAME	DISPLAY UNIT (TABLETOP MOUNT)
DWG.No. C2376-G01- A	REF.No. 02-160-100G-0		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

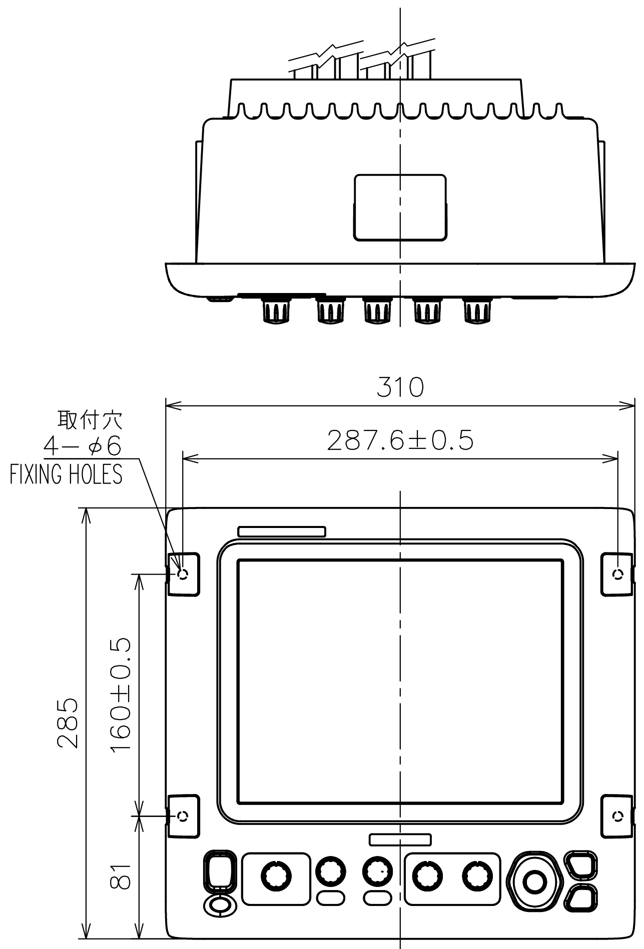
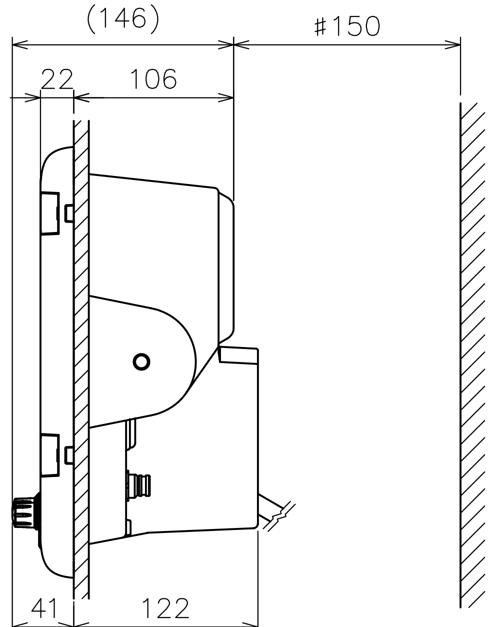
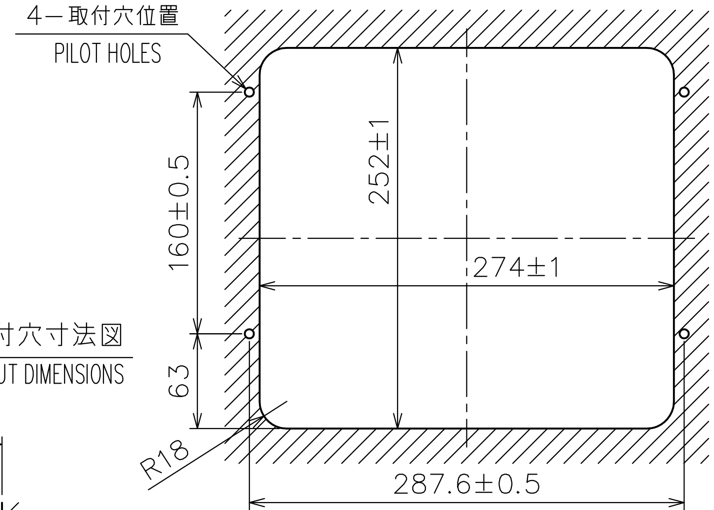
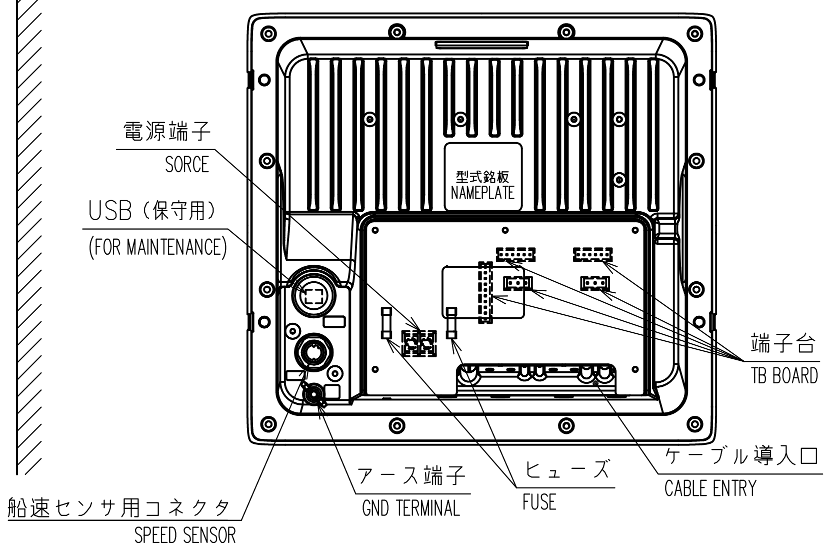


表１ TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50＜L≦100	±2.5
100＜L≦500	±3





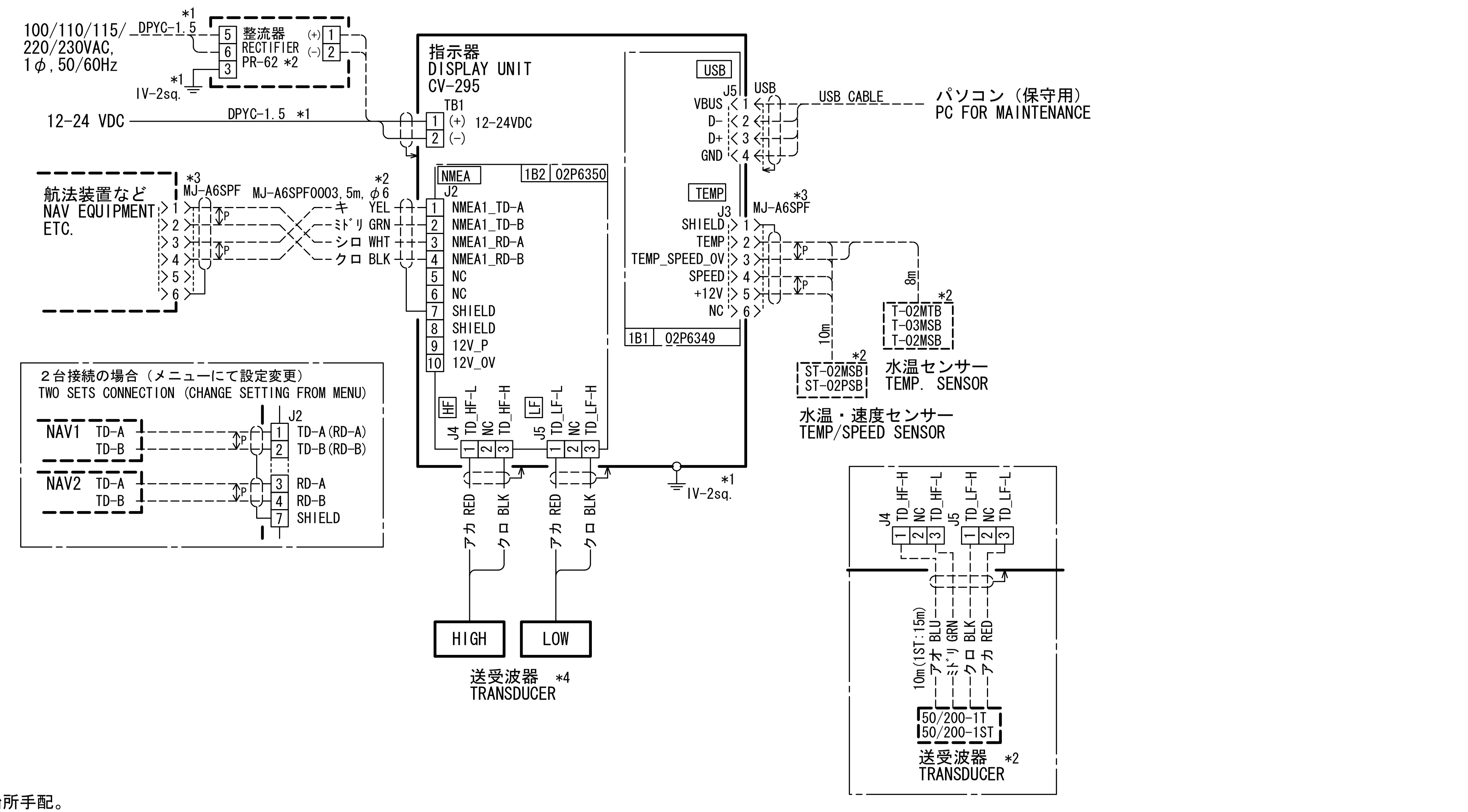


注 記 1）指定外の寸法公差は表1による。
2）＃印寸法は最小サービス空間寸法とする。
3）取付用ネジはトラスタッピンネジ呼び径5×20を使用のこと。
4）装備ケーブルはサービス時、本体を前方に十分引き出せるよう余裕を持たせること。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS φ5x20 FOR FIXING THE UNIT.
4. KEEP SUFFICIENT CABLE LENGTH BEHIND THE UNIT FOR MAINTENANCE.

DRAWN Nov. 1 '07 T.YAMASAKI		TITLE	CV-295
CHECKED Nov. 1 '07 T.TAKENO		名称	指示部（埋込装備）
APPROVED Nov.12'07 R.Esumi			外寸図
SCALE 1/5	MASS 6.0 ±10% kg 質量はケーブルを含まず。 MASS W/O CABLE.	NAME	DISPLAY UNIT (FLUSH MOUNT)
DWG.No. C2376-G02- A	REF.No. 02-160-110G-0		OUTLINE DRAWING

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注記
＊１）造船所手配。
＊２）オプション。
＊３）コネクタは工場にて取付済み。
＊４）送受波器82B-35RはHF/LFのいずれかに接続。

NOTE
*1: SHIPYARD SUPPLY.
*2: OPTION.
*3: CONNECTOR PLUG FITTED AT FACTORY.
*4: CONNECT THE 82B-35R TRANSDUCER TO EITHER HF OR LF.

DRAWN 16/Apr/09 T. YAMASAKI		TITLE	FCV-295
CHECKED 16/Apr/09 T. TAKENO		名 称	カラー魚群探知機
APPROVED 9/Jun/09 R.Esumi			相互結線図
SCALE	MASS	NAME	COLOR LCD SOUNDER
DWG. No. C2376-C01- D	REF. No. 02-160-1001-1		INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.

ECF
(Elemental Chlorine Free)
The paper used in this manual
is elemental chlorine free.

FURUNO ELECTRIC CO., LTD.

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• FURUNO Authorized Distributor/Dealer

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